

## **CHAPTER 8**

### **DELIVERY OF THE FINISHED DENTURES**

After the dentures have been processed and de-flasked, they are delivered to the patient following certain steps, these are:

- I. Laboratory remounting.**
- II. Inspection of the dentures.**
- III. Insertion of the denture in the patient's mouth.**
- IV. Clinical remounting.**
- V. Post-insertion instructions and care.**

The construction of the denture involves many separate but related procedures. An error in any step contributes to an error in the completed denture.

#### **Inaccuracies may thus result due to:**

- ❖ Errors in clinical procedures.
- ❖ Errors in laboratory procedures occurring during processing.
- ❖ Deficiencies of materials used in denture construction.

#### **I- LABORATORY REMOUNTS:**

Laboratory remounting is a procedure by which the processed dentures are returned to their previous mounting on the articulator to correct occlusal errors resulting from laboratory procedures during denture processing.

**These errors may result due to:** (see page 6 )

#### **Advantages of laboratory remounting:**

- 1- Errors in the processed denture are easily spotted on the articulator rather than in the patient's mouth as the resiliency of the soft tissues may disguise premature occlusal contacts due to shifting of the denture bases.
- 2- Correcting occlusal errors before denture insertion provides the patient with comfort and psychological confidence.

## **Technique for laboratory remounting:**

### **Split-cast remounting technique:**

After deflasking, the processed dentures while still on their casts are returned back to the articulator on the same mounting used for the try-in stage. For this reason certain precautions and steps should be carried out (Fig. 8: 1,2) these are:

- 1- Cutting indices or grooves in the bases of the cast before mounting them on the articulator.
- 2- Applying separating medium on the casts before mounting to facilitate their separation from the articulator.
- 3- Separation of the casts from the plaster mounting should be done carefully to avoid damage.
- 4- The indices on the casts should be protected by tin foil during processing.
- 5- Deflasking should be done carefully to avoid damaging the casts.
- 6- The surface of the casts should be free of any plaster particles that may interfere with repositioning of casts on the original mounting on the articulator.
- 7- After deflasking, the casts are returned to the articulator guided by the indices on the casts and the corresponding elevations on the plaster mounting present on the articulator.
- 8- The casts are carefully attached to the articulator by plaster. The articulator is locked in centric position and the dentures are checked.
- 9- Make sure that upper and lower anterior teeth are free of contact in centric position.
- 10- Make sure that incisal pin touches the incisal table.
- 11- Occlusal errors are spotted and selective grinding is carried out to eliminate premature contact and restore both centric occlusion and vertical dimension.
- 12- Denture is then finished and polished.

**Fig. 8-1:** The base of the cast is indexed for direct remounting.



**Fig. 8- 2:** Denture after deflasking



## **II- DENTURE INSPECTION:**

Before placement in the patient's mouth, the denture should be inspected on both its tissue surface and polished surface.

- a. Inspection of the tissue surface should be carried out to eliminate acrylic spicules, beads or nodules caused by cuts scratches or air bubbles on the cast surface (**Fig. 8-3**). These may cause trauma to the contacting tissues. Any correction on the denture-tissue surface must be minimal and should be carried out carefully. Polishing should be avoided not to alter the accuracy of contact with the tissues to preserve denture base thickness.



**Fig. 8-3:** Inspection of the tissue surface of the upper complete denture

- b. Denture borders and frenal notches should be examined to insure rounded borders and to eliminate sharp edges. Frenal notches should be enlarged just to allow full freedom of frenal attachments. Labial notches are widened vertically in sagittal

plane while buccal notches are widened obliquely in an antero-posterior direction (Fig. 8-4).

- c. Denture flanges should be examined to insure that they are not too thick or obviously over-extended. The edges of relief areas should be rounded and smooth.



*Fig. 8-4: Examine the denture borders & frenal notches, then treated them. Checking the lower denture in relation to the buccal frenum.*

### **III-TRIAL PLACEMENT OF THE DENTURE:** (Fig. 8-5)

Patients should have been instructed not to use old dentures **12-24 hours** before the insertion appointment to insure proper seating of the new dentures on healthy undistorted tissues. Dentures are checked as in the try-in stage. Each denture should be checked separately then both dentures are checked together. Extension, retention, stability, height of occlusal plane, tongue space, facial contour and appearance are all evaluated following the previous steps as in the try-in stage.

*Fig. 8-5: Checking the retention*



### **Checking occlusion**

***Occlusion should be checked to achieve the following:***

- 1- Elimination of any interceptive premature contacts between upper and lower teeth.
- 2- To insure coincidence of centric occlusion with centric relation.
- 3- To achieve simultaneous contact between upper and lower teeth in centric position when non-anatomic teeth are used in centric balance.

4- To achieve balance in both centric and eccentric positions when anatomic teeth are used.

### **Occlusal errors may result due to:**

#### **1- Clinical errors:**

- Ill fitting trial denture bases.
- Shifting of the trial denture bases over displaceable tissues.
- Change in the position of the wax rims.
- Inaccurate jaw relation records.
- Unequal stress distribution during registration of maxillomandibular relations.

#### **2- Errors in mounting casts on articulator:**

- Record bases being improperly seated and sealed to the casts during mounting.
- Dimensional changes in the denture base material.
- Improper sealing and movement of occlusion rims during mounting.
- Interference of upper and lower casts in the posterior region.
- Mounting rings being improperly locked or articulator being improperly locked in centric position.
- Articulator wears. All articulators are subject to wear and the older and more worn the articulator the greater will be the errors in occlusion and articulation.

#### **3- Errors in laboratory procedures:**

- Vertical changes in articulator setting.
- Changes made on the articulator by the technician after the try-in.
- Expansion of plaster used for flasking
- Contraction of acrylic resin during processing
- Movement of teeth in wax before and during flasking.
- Improper packing, curing and handling of the flask.
- Over heating of dentures during polishing.

### **Treatment of occlusal disharmony**

These errors in occlusion must be eliminated before the dentures are worn, so the soft tissues interposed between the bone and the denture bases will not be distorted by discrepancies in the occlusion.

One of the following methods may be used for correcting occlusal disharmony by selective grinding:

**I- Intraoral methods.**

**II- Direct remount.(laboratory remount, Mentioned before)**

**III- Remount via new jaw relationship records. (clinical remount)**

#### **IV. CLINICAL REMOUNT:**

Clinical remount is a procedure whereby occlusal refinement is carried-out on the articulator after remounting the dentures with new records obtained from the patient.

The upper cast is mounted either by a new face-bow record or by using a previously prepared face-low index. The lower cast is mounted to the articulator according to a new centric relation record. Eccentric records will be required to set adjustable articulators if anatomic occlusal pattern is used.

#### **Procedure for clinical remount:** (Fig. 8- 6 & 7)

- All undercuts on the tissue side of the denture are blocked out with clay or asbestos and lubricated with petroleum jelly.
- Stone casts are poured.
- The maxillary cast is mounted on the articulator either according to a new face-bow record or to an occlusal index (***face bow index***).
- The mandibular denture is oriented to the maxillary denture by an inter-occlusal centric relation record taken from the patient. This record is made by placing either a softened wax wafer or impression plaster on the lower denture teeth and guiding the patient to close in centric relation. The patient closes into the wax until a good index ***with no penetration is made***. This inter-occlusal record should be rechecked to insure accuracy.
- The mandibular denture carrying the inter-occlusal record is positioned on the remount cast and carefully oriented and secured to the mounted maxillary denture. The lower cast is then secured to the lower compartment of the articulator using plaster. Eccentric jaw relations made are recorded to adjust the condylar elements of the articulator.
- Premature occlusal contacts are spotted. Selective grinding is then carried out to achieve balance in centric and eccentric positions.

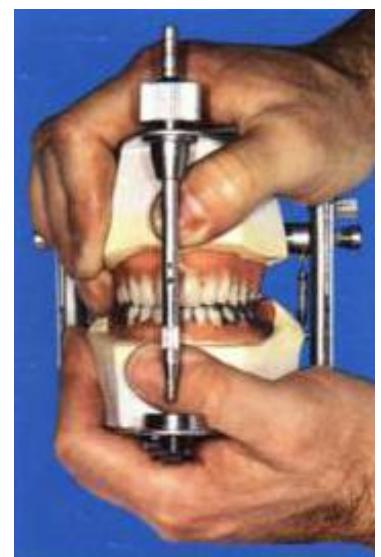
The face-bow, with the upper denture secured to its fork, is adjusted on the articulator with plaster of Paris. The undercuts of the fitting surface of the denture have been previously blocked out with wax or plasticine. A new centric relation is registered and employed for remounting the lower model on the articulator in relation to the upper model. The condylar guidance is then registered on the articulator.



*Fig. 8-6: The dentures remounting in the articulator*

#### **Advantages of clinical remount:**

- 1- Correction of errors is done on the articulator rather than in the patient's mouth, thus reducing patient's participation and hence better psychological reaction.
- 2- The articulator provides a stable rather than resilient soft tissue working foundation.
- 3- More accurate articulating paper markings are expected due to the absence of saliva.
- 4- It is easier to see, spot and correct errors on the articulator rather than in the patient's mouth.



*Fig. 8-7: Refinishing the occlusion with carborundum paste between the teeth (**Right**), before occlusal adjustment (**Left**) and the occlusion has been corrected & the mandible can make excentric gliding movements in all directions without interferences (**Meddle**).*

## **Methods for detecting occlusal errors:**

Several methods are used to detect and eliminate occlusal errors, these are:

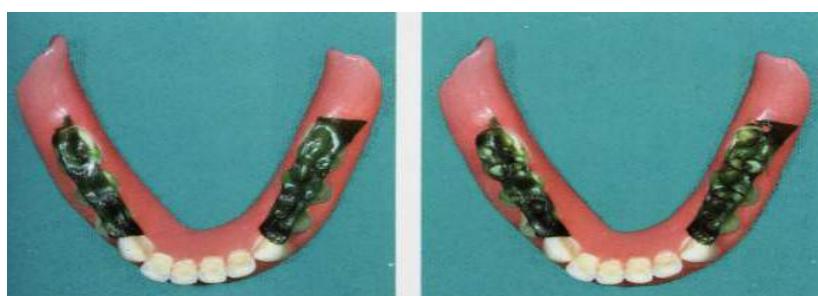
### **1- Articulating paper:**

Articulating paper is used to detect premature occlusal contacts, either in the patient's mouth or on the articulator.

Articulating paper of minimum thickness is placed bilaterally between the teeth. The teeth are tapped together to obtain markings indicating high occlusal spots. Incorrect misleading markings may result if the check is done in the patient's mouth due to shifting of the dentures on the resilient soft tissues supporting the dentures.

### **2- Wax: (Fig. 8 - 8)**

Adhesive wax or carding wax is used to detect premature contact. It is placed on the occlusal surfaces of mandibular denture teeth and the patient is asked to close to the first tooth contact. Points of penetration denoting premature contacts are marked with lead pencil and relieved. However, shifting of bases over resilient soft tissues may give false markings.



*Fig. 8-8: Checking the occlusion using wax.*

### **3- Abrasive paste:**

Abrasive pastes should only be used to remove minute occlusal irregularities because they have the following disadvantages:

- Abrasive paste causes loss of vertical dimension due to abrasion of teeth.
- Errors in occlusion will be accentuated because of shifting of dentures during grinding.
- Loss of sharpness of the cusps of anatomic teeth.

### **4- Central bearing devices (Balancer or Correlator): (Fig. 8-9)**

Central bearing devices are used to stabilize the dentures in the mouth during the detection of occlusal errors. They consist of a pin usually attached to the lower

denture and a plate attached to the vault of the upper denture. When the patient closes his mouth, the pin touches the plate, thus holding and stabilizing both dentures in place. Premature contacts are then detected by articulating paper. This device also prevents shifting of dentures, which occurs when premature contact is made by one tooth.

The pin of the central bearing device should be located at the exact center of both upper and lower jaws to prevent tilting of the dentures. This is rather difficult because the center of the lower jaw doesn't necessarily coincide with that of the upper. The correlator and the balancer are central bearing devices. The correlator has a spring attached to its pin while the balancer has no spring.

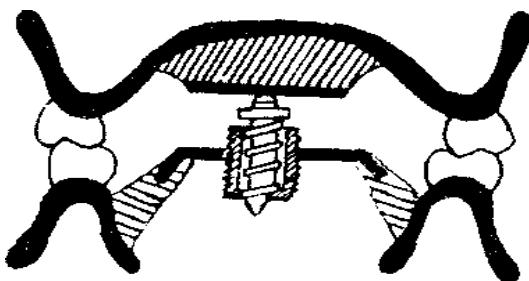


Fig. 8-9: Central bearing device.

## **Selective grinding rules**

The spotted premature occlusal contacts are removed using mounted stones. Selective grinding is carried out on the articulator until balance in centric position and occlusal harmony in eccentric positions is achieved. The teeth are then polished. The dentures are returned to the patient's mouth and the occlusion is finally checked and refined.

*Selective grinding for refining occlusion in cusped teeth should be done as follows:*

### **1- In centric position: (Fig. 8-10 a)**

In normal occlusion the palatal cusps of upper posterior teeth and the buccal cusps of the lower contact the opposing central fossae. These cusps maintain the occlusal vertical dimension and are called "**Centric holding cusps**".

Premature contact of one or more of these cusps may cause space (open contact) between other posterior teeth resulting in an increase in occlusal vertical dimension. Hence, these cusps or the opposing central fossae should be selectively

ground to achieve proper contact and restore vertical dimension. This can be done as follows:

- \* If the cusp is high in both centric and eccentric relations, this cusp should be reduced. If high in centric only deepen fossa.
- \* After all premature contacts have been removed in centric occlusion; neither the centric holding cusps nor the opposing fossae should be reduced to avoid destruction of occlusal vertical dimension.

## **2. Lateral position: (Fig. 8-10 b)**

Occlusion should be refined in the lateral position both on the working and balancing sides.

### **Working side:**

Premature contact was detected on the working side (side to which movement takes place) will be accompanied by open contact on the balancing side.

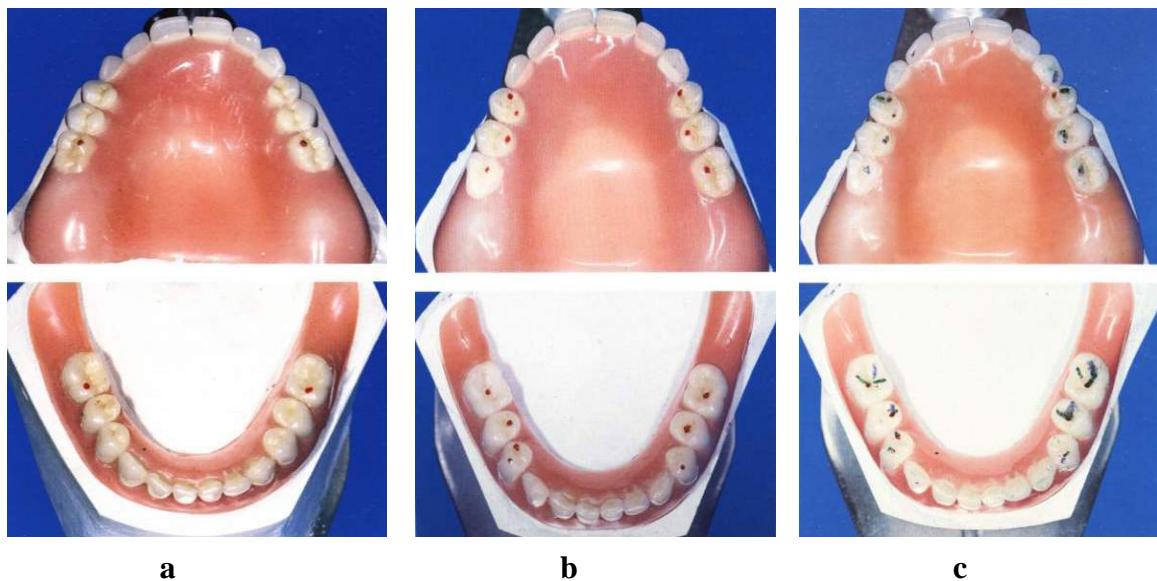
The "**Bull**" rule is followed to eliminate premature contacts on the working side. The buccal upper and the lingual lower cusps are ground to establish contact on the balancing side. Reducing palatal cusps of the upper teeth or the buccal cusps of the lower will destroy contact in centric position and reduce the vertical dimension.

### **Balancing side:**

Interceptive cusps on this side are the centric holding cusps. The mandibular buccal cusps are ground in preference to the opposing palatal cusps leaving the maxillary cusp to provide a more stabilizing effect to the lower denture.

## **3. Protrusive position: (Fig. 8-10 c)**

Premature contact in the protrusive position is eliminated by grinding the distal inclines of maxillary cusps and mesial inclines of mandibular cusps.



**Fig. 8-10:** Checking the centric relation (Left), lateral excursions (Middle) & protrusion (Right).

#### **Management of dentures exhibiting incorrect jaw relations:**

In spite of careful procedures carried-out at the try in stage, the finished denture may exhibit an incorrect jaw relation. This may be due to dentures being made to occlude in a slight forward position i.e. the mandible was not in the most retruded position or due to wrong vertical dimension.

##### **a- Dentures exhibiting wrong centric relation:**

- If the position of the mandible was slightly forward, i.e. not more than 1/2 cusp, grind the **mesial inclines of the upper teeth and distal inclines of lower teeth**.
- If centric occlusion is incorrect but anterior teeth exhibit proper overlap, then lower posterior teeth are removed and replaced by wax rims having proper height. Centric relation is then recorded, dentures are remounted and posterior teeth are re-set and attached by self-curing resin.
- If centric occlusion is incorrect and the anterior overlap is abnormal all lower teeth are removed and a new centric record is made.
- In most cases exhibiting excessively wrong centric relation, the denture should be remade.

##### **b- Dentures exhibiting wrong vertical dimension:**

- Dentures exhibiting either excessively increased vertical dimension or over closing should be remade.

- A slight increase in vertical dimension could be simply treated by selective grinding but over grinding should be avoided in order not to distort the occlusal anatomy of teeth.
- Increased vertical dimension could also be treated by removing all teeth from the lower dentures and re-setting them to the correct vertical dimension if the upper denture has correct relation.

## **V- POST-INSERTION INSTRUCTION & CARE:**

The patient should be informed about limitations of complete dentures. It makes the patient more tolerable to problems, rather than considering them as excuses given by the dentist. The patient should be given advices and instructions concerning the following:

### **1- Wearing dentures:**

- New denture wearers are advised to wear dentures day and night only *for the first two days* to reduce the period of discomfort and to allow tongue, cheeks and lips to accommodate and adapt to the presence of dentures. But later on, patients should be instructed to remove their dentures at night to provide rest for the tissues from stresses exerted upon them and to give the tissues chance to recover.
- When dentures are out of the mouth, patients are instructed to place them in a container filled with water to prevent drying and dimensional changes in the denture base material.
- Patients should be cautioned about using denture adhesives as these may modify the position of the denture on the ridge resulting in change in the vertical and centric relations. By time patients may feel insecure without adhesives.

**2- Mastication:** Eating with new dentures may require 6-8 weeks learning period, during which new memory patterns are established for both, the facial muscles and muscles of mastication.

### ***Patients should be advised that:***

- Food should be cut into small pieces and only a little should be placed in the mouth at a time.
- Cut food with fork and knife rather than incise with anterior denture teeth.
- Bilateral rather than unilateral chewing is advised to prevent tipping of the denture.

- Sticky and fibrous food should be avoided in the early period.

### **3- Speaking:**

Patients should be informed that speaking normally with dentures requires a short practice period. Patients are advised to read aloud and repeat words that are difficult to pronounce. The tongue becomes conscious of the reduction of space resulting from the presence of dentures causing difficulty in speech. This condition usually resolves after adaptation of the tongue to the new condition.

### **4- Oral and denture hygiene:**

- Patients should be instructed to rinse their dentures and mouths after meals. Dentures should be removed and soaked in a denture cleanser once a day for 30 minutes. This is required for effective killing of microorganisms and removal of stains.
- Leaving the denture overnight in a cleansing solution.
- Dentures should be brushed with a soft toothbrush preferably over a basin partially filled with water to prevent accidental drop and breakage.
- Tooth paste and solutions containing phenol should be avoided to prevent abrasion and crazing of the denture, especially acrylic dentures. Also hot water should be avoided as it may cause warpage of acrylic resin.

### **Post insertion care:**

The adjustment period following denture insertion is critical for the success of dentures. An appointment should be scheduled **1-3 days** after insertion to eliminate any trouble shooting. Post insertion appointments should be periodically scheduled to eliminate further errors resulting from settling of dentures and those, which arise due to warpage of resin bases. During these appointments the dentures should be re-evaluated as regards, vertical dimension, coincidence of centric occlusion and centric relation and appearance; clinical remounting is advisable to correct any occlusal prematurities that may develop.